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STATUS OF OBSERVER DATA MANAGEMENT

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1. Introduction

1. Observer data management encompasses a number of activities that ensure the data collected by observers are made available for the work of the Western and Central Pacific Fisheries Commission (WCPFC) in a form that is both representative and of acceptable quality. The main data management responsibilities include the entry and management of observer data in a standardised database system but include a suite of additional activities described in detail in Williams (2011).

2. The Eighteenth Regular Session of the Commission (7–15 December 2021; Anon., 2022) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2022-2024.

3. The Pacific Island Forum Fisheries Agency (FFA) processes observer data for the US Multilateral Purse Seine Treaty and these data are regularly incorporated into the ROP data submitted to the WCPFC. Staff supported by the WCPFC ROP data management project, based at the WCPFC Secretariat, mainly process data from the national observer programme of the Federated States of Micronesia (FSM). WCPFC members other than Pacific Island countries have also contributed to the ROP database including Australia, China, the European Union, Japan, Korea, New Zealand, Philippines, Chinese Taipei and the USA.

4. The majority of observer data processed by the SPC are ROP-defined purse seine trips[1], which have been designated as the highest priority for processing since 2010. However, the WCPFC requirement for 5% observer coverage in the longline fishery (established in 2012) has resulted in increased submission of observer longline data in recent years and these data are now assigned equal priority for processing as the purse seine observer data. The SPC-OFP also processes non-ROP observer data that are of importance to the scientific work of the WCPFC and so have been included in the description of observer data management and data summaries presented in this paper.

5. SPC-OFP has also been provided with a significant amount of data generated from Electronic Monitoring (EM) initiatives undertaken by several Pacific Island countries in recent years. These data are aligned with the ROP minimum data standards but are considered as a different data source to data collected by human observers, which is consistent with the philosophy of WCPFC Project 93 (FFA, PNAO, SPC and WCPFC Secretariat, 2019). There has also been a recent initiative to produce independent draft minimum EM data field standards in Pacific Island countries (SPC, FFA and PNAO, 2020). A breakdown of data generated from EM initiatives has been included in this paper (Table 8).

6. This paper serves to provide an update on the status of ROP data management at SPC-OFP, covering the following:

- Activities over the past 12 months
- Status of observer data entry, data provisions, coverage and issues; and
- Future expectations.

7. The SC is encouraged to review the information in this paper and provide suggestions for enhancements for future WCPFC meetings, as required.

[1] CMM 2018-05 paragraph 5
Scope of the Commission ROP
5. The Commission ROP shall apply to the following categories of fishing vessels authorized to fish in the Convention Area in accordance with the Commission's Conservation and Management Measures 2004-01:
i) vessels fishing exclusively on the high seas in the Convention Area, and
ii) *vessels fishing on the high seas and in waters under the jurisdiction of one or more coastal States and vessels fishing in the waters under the national jurisdiction of two or more coastal States*.

2. Activities over the past twelve months

8. The work related to observer data management achieved over the past twelve months includes:

- SPC technical staff continued to provide remote technical support to the observer data entry staff based at the offices of the WCPFC Secretariat. Further progress was made in refining the process for transferring WCPFC ROP data to the WCPFC Secretariat.
- The major developments for the Tufman 2 (Observer component) have now been completed, although there is regular, ongoing maintenance of this system. Enhancements and trials of the Electronic Reporting (ER) system (OLLO) for observers active in the South Pacific albacore longline fishery was one of the features of work for the SPC development team during the past year. OLLO was used at sea in New Caledonia, Tonga, Fiji, Cook Islands and French Polynesia during the last twelve months.
- SPC technical staff continued to provide regular support to other countries and regional agencies processing observer data using the Tufman 2 observer component.
- Remote (and some direct) support continued to be provided to Fiji, RMI and FSM to assist with quality control of data generated from EM systems and assistance on the use of online web-based Observer database-reporting module ("Tufman Reports") reports, which summarise EM data and provide comparisons of EM data to other types of data (logbook, onboard observer and port sampling data).
- The most time-consuming work over the past year for the observer technical staff continued to be the update of data loaders for the non-standard[2] observer data provided by several WCPFC member countries (CCMs) for their national observer programme data. Over the past year, non-standard longline observer data have been provided for the following fleets/years: Australia (2019; EM data), China (2021), Japan (2021), New Zealand (2020), US (Hawaii/American Samoa 2021), Korea (2021) and Chinese Taipei (2021). All of the non-standard observer data have now been loaded, although some data quality issues require manual intervention and/or referral to the original source of the data and has proved to be time consuming. However, several countries providing non-standard observer data are now using the WCPFC ER observer data field standards[3] to submit their observer data, which significantly reduces the time taken to load the observer data provided by these countries (up to five times faster).
- DORADO was replaced by a new web-based reporting tools called "Tufman Reports". This reporting tools continues to be enhanced and used regularly by national observer providers, the WCPFC, FFA Secretariats and several other CCMs. This system continues to be used by Pacific Island countries in preparation of the WCPFC annual reports Part 1 and Part 2 for submission, and the system will continue to expand and evolve over the coming years to meet the requirements of not only national observer programmes, but also SPC, the WCPFC Secretariat, FFA and the PNAO.
  The restrictions in the region during 2020 and 2021 due to the impacts of COVID-19 presented various challenges in observer data collection and data management throughout the region. The decline in purse seine observer data from April 2020 was noticeable and is described in tables and figures included in this paper. Regional and sub-regional meetings and workshops were usually a good opportunity for national observer programmes to submit their scanned workbooks to SPC saving time where bandwidth is limited in transmitting scanned data. Despite these new challenges, observer data submission and data entry were not delayed and were comparable with previous years.
- In 2019, SPC technical staff developed a module in Tufman2 to manage the data entry of the debriefing data. Some reports have been made available in the reporting tools "Tufman Reports" but more consultation is required with the member countries to ensure they can access all the data.

[2] We refer to "non-standard" as observer data that are not entered using the Tufman 2 system, or do not align to the WCPFC ER observer data field standards (i.e. they are provided in different formats by CCMs which requires the development of specific data loaders)

[3] https://www.wcpfc.int/doc/data-05/e-reporting_ssps

3. Status of Observer data entry, data provisions and issues

9. Table 1 shows the status of observer data received and entered by SPC as of July 11th 2022. Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 details the coverage of Regional Observer Programme (ROP) longline activity for 2020 as reported by the flag state and according to the metrics proposed at TCC10[4] and agreed on at WCPFC-11[5]. Table 4 shows the coverage of ROP longline activity for 2021, as reported by the flag state. Tables 3 and 4 also provide an indication of the longline ROP data submitted to WCPFC/SPC by year and fleet, with the coverage of the data provided; this allows a comparison to the coverage as reported by the flag state and is used to evaluate compliance in achieving the required ROP longline coverage of 5%. Tables 5 and 6 provide an indication of both ROP and non-ROP (i.e. total observer) data provided to SPC with an estimated total observer data coverage relevant to the scientific work of the WCPFC.

10. Pacific Island observers and programmes generate most of the observer data used by the Commission and Table 7 provides an indication of the extent of data generated in recent years. There has also been a significant amount of data generated from EM (although acknowledging the more recent impacts due to COVID-19), and an attempt to quantify these data has been made in Table 8.

11. As noted in previous versions of this report, the summaries of observer data provisions presented herein continue to be constrained by several factors [see Williams et al. (2017) for the details of each factor], including:

i. Accurate information on the complete number of vessel trips by gear and flag in the WCPFC Convention Area;
ii. Accurate information on the actual number of observer trips by observer programme, gear and flag; and
iii. Assignment of an ROP trip in the unprocessed data.

3.1 Purse seine

12. Provisions of purse seine observer data from 2012–2020 have been described in previous versions of this paper.

13. Observer data for an estimated 15% (294 trips out of 1980 trips according to VMS data) of observer purse seine trips conducted during 2021 have been received at SPC at the time of writing this paper. The 2021 observer data received represents 100% of the trips with known observer placements (294 trips).

14. A total of 100% (294 trips) of the observer data received at SPC for 2021 observer activities have now been entered. SPC employs a strategy of processing the most recent observer data (in this case 2021 data) as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the "**% of trips received without problems**" in **CATEGORY 5** of Table 1 whereby the outstanding data entry for 2021 (for example) had a higher priority than the outstanding trips to be entered in earlier years, and therefore a higher proportion in this column. The outstanding trips for earlier years will be entered once the current priority for 2021 data entry has been achieved (i.e. resolving the outstanding issues in trip data already received and working with observer programmes in regards to the submission of trips not yet received). For the 2021 purse seine trips received at SPC, none of the trips had problems awaiting to be resolved, which is, so far, a significant improvement on previous years.

15. The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage of 2021 observer data submitted to SPC is generally high, with respect to observer data with known placements, but acknowledging the overall purse seine observer coverage for 2021 is only ~15-20% due to the impacts of COVID-19.

[4] See the TCC10 paper at http://www.wcpfc.int/node/19567
[5] See the WCPFC11 report at http://www.wcpfc.int/node/20349, para 477 and Attachment L, Table 1

16. Figure 1 highlights the continuation in the data entry work done by the SPC team and the data entry staff in the region. This graph represents the number of purse seine trips entered during each month years 2020 and 2021 and the colours represent a breakdown of when the processed trips were conducted. The graph highlights (1) the priority given to the more recent trips and (2) the data entry work done to catch up with the backlog of the previous years. The timely data entry of 2021 and 2020 observer data has meant that data for the most recent calendar year were available for the scientific work required for SC18.

17. As reported in previous years, the 'problematic' trip data held at SPC awaiting resolution are mainly due to incomplete or poor-quality scanned data submissions. However, trips conducted in 2021 and received by SPC so far showed no problem.

18. It is important that the observer trip data rejected by the observer programmes still be submitted to ensure all observer trip data are available, and that the problems encountered can be reviewed and referred to in future training, debriefing and data quality control procedures. Information on the trips "with unknown status" will require follow-up with flag state and observer service providers, in the absence of any observer trip reporting obligations. Provision of a list of ALL observer trips conducted by each observer service provider on a regular basis would enhance the summary reports presented in this paper. The lack of provision of 'observer placement lists' from some national observer programmes remains a major issue.

19. We also highlight the importance of observer service providers submitting debriefing evaluations/scores to allow the assignment of appropriate data quality indicators to the data. In the future, we plan to work with observer providers to resolve the backlog of observer debriefing data and incorporate debriefing data from the PNA FIMS (Fisheries Information Management System) observer-debriefing component into the regional observer database. We anticipate reporting summaries from the observer debriefing data in future versions of this report.

20. Figure 2 provides an indication of the spatial coverage of the purse seine observer data for 2021, noting that the domestic fisheries of Indonesia, Philippines and Vietnam are not shown (although the Philippines purse seine fleet observer effort in the high seas pocket #1 is shown). The spatial coverage of available purse seine observer data for 2021 in the tropical fishery is not as representative as previous years due to the impacts of COVID-19 but at least appears to cover the spatial extent of the fishery.

3.2 Longline

21. SC11 directed SPC to present a table of longline ROP coverage which included both the coverage reported by each CCM for their longline fleet and the coverage of that fleet according to data provided to the WCPFC. Tables 3 and 4 have been prepared in response to this recommendation for longline ROP coverage for 2020 and 2021, respectively.

22. Previous versions of these tables included the trips for fleets that are restricted to the home EEZ/adjacent high seas only (which are defined as non-ROP). The 15th WCPFC Scientific Committee (SC15), held in Pohnpei, FSM in August 2019, recommended that future versions of Tables 3 and 4 exclude the non-ROP defined data and only report on ROP longline coverage.

23. Tables 5 and 6 provide a breakdown of all longline observer data (ROP and non-ROP) provided to the WCPFC Science Service Provider for Commission work, covering 2020 and 2021, respectively. These tables use the common longline effort metric (hooks) and indicate that overall coverage was 4.5% and 3.0% (respectively for 2020 and 2021) according to data provisions to date. Due to the impacts of COVID-19, it is unlikely that the longline observer coverage for 2021 will exceed the required 5% once all data are submitted.

24. Figures 3 and 4 provide an indication of the spatial coverage of all longline observer data (ROP and non-ROP) provided for 2020 and 2021, respectively. Spatial coverage of longline observer data has improved in recent years, but as noted, the impacts of COVID-19 in 2020 and 2021 means that the spatial coverage will be less representative in 2020 and 2021 than the previous few years (2017-2019).

3.3 Contribution of Pacific Island observer programmes

25. Table 7 provides a breakdown of observer data collected by each Pacific Island (PIC) observer programme for 2020 and 2021. For purse seine, the PIC observer data currently cover 38.1% of the tropical WCPFC fishery (based on total tuna catch estimates for the tropical fishery) for 2020, and 7.6% for 2021 (acknowledging that the overall coverage for the tropical purse seine fishery in 2020 is expected to be only 40–45%, and 15%-20% in 2021). For longline, the PIC observer data currently covers 1.5% and 1.09% of the fishery, respectively for 2020 and 2021, based on total WCPFC tuna catch estimates.

4. References

Anonymous. 2010a. Report of the Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.

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FIGURES

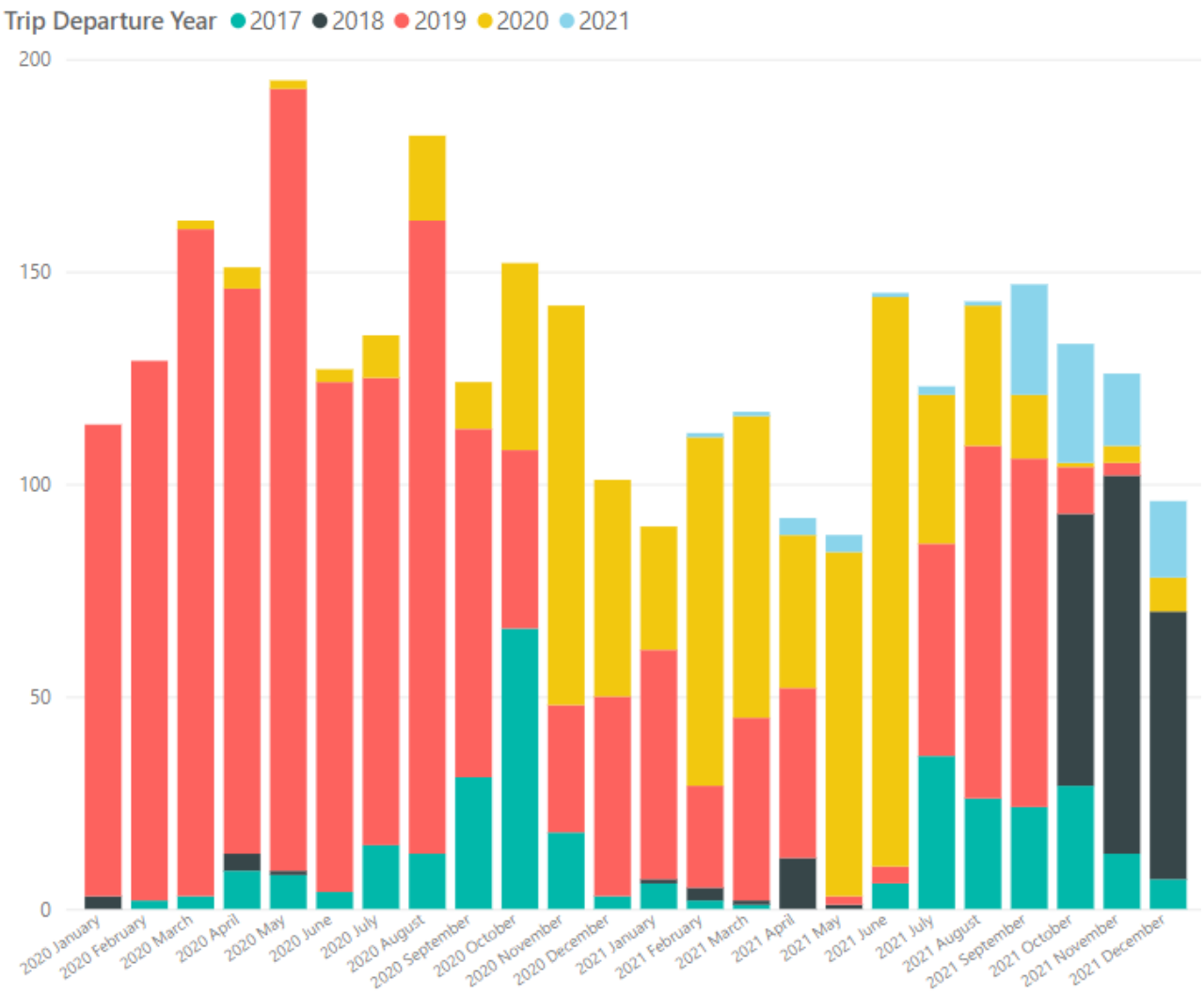


Figure 1. Monthly data entry of purse seine observer data over the past two years. The x-axis represents the year/month when respective observer data were entered into SPC system. The colours represent the departure year for the trips. For example, from January 2020 to September 2020, most of the data entry was from trips conducted in 2019.

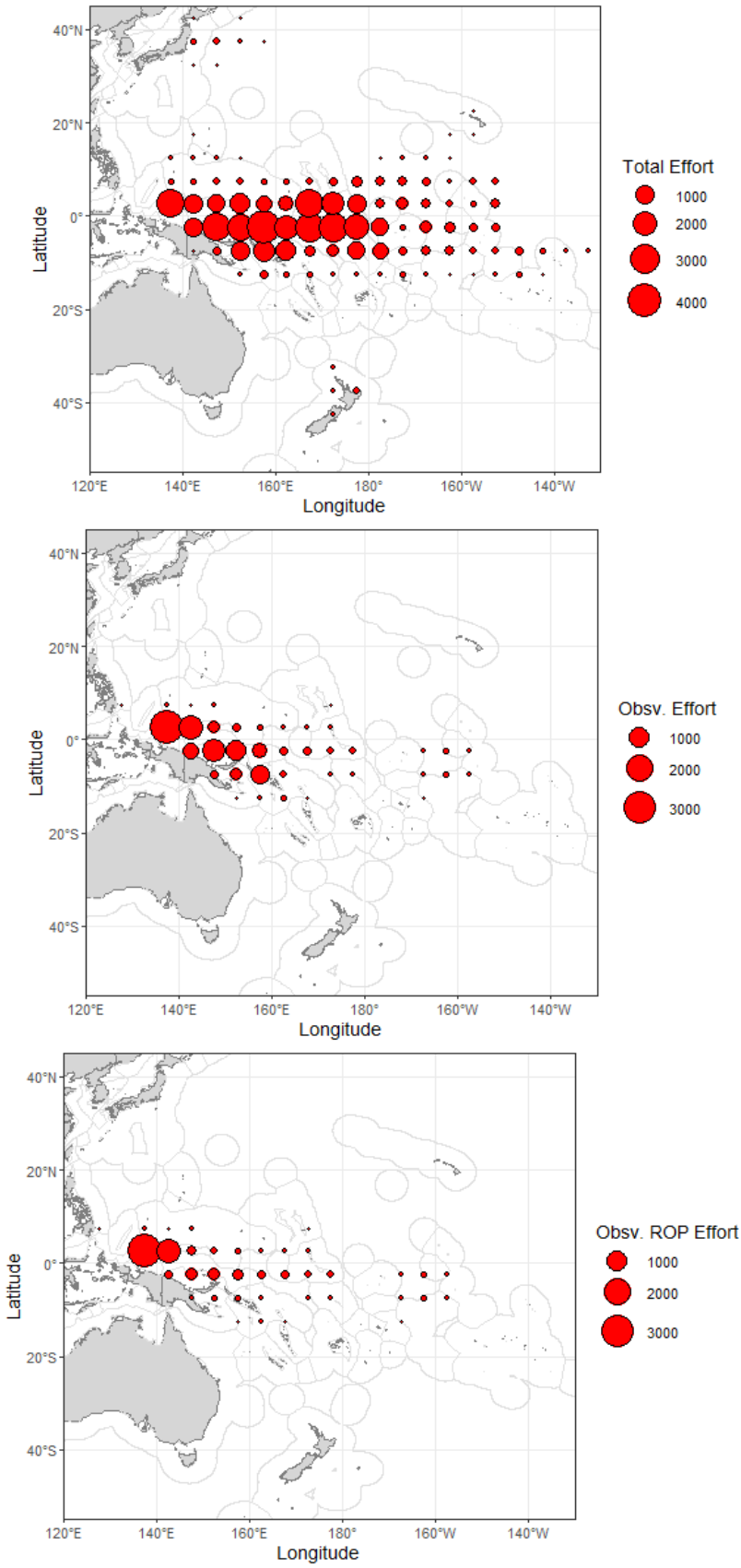


Figure 2. Distribution of purse seine effort (days; top), observed effort (days; middle) and observer ROP effort (days; bottom) in the WCPFC Area for 2021. A day of effort includes fishing and searching. (These data exclude Indonesia, Philippines and Vietnam domestic fisheries)

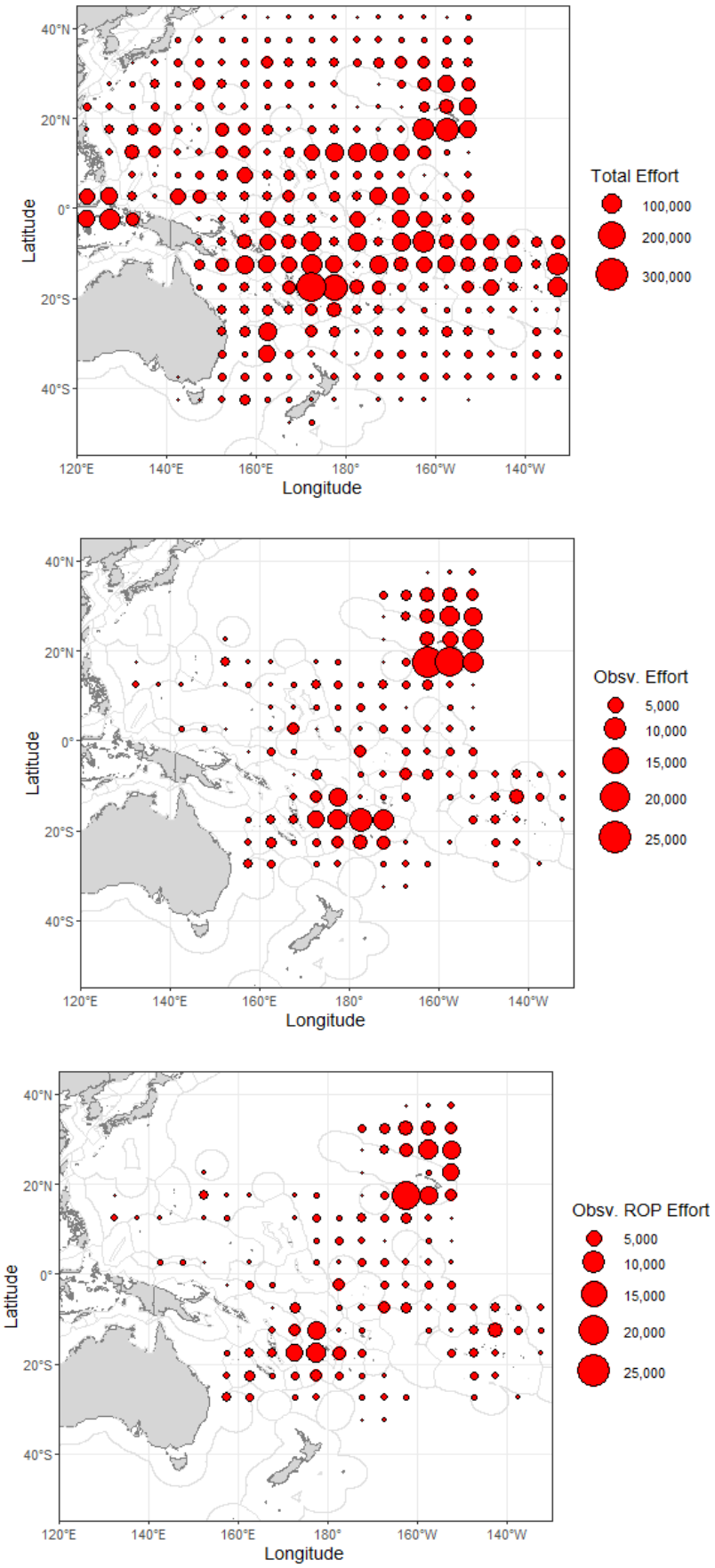


Figure 3. Distribution of longline effort (100 hooks; top), observer effort (100 hooks; middle) and observed ROP effort (100 hooks; bottom) in the WCPFC Area for 2021.

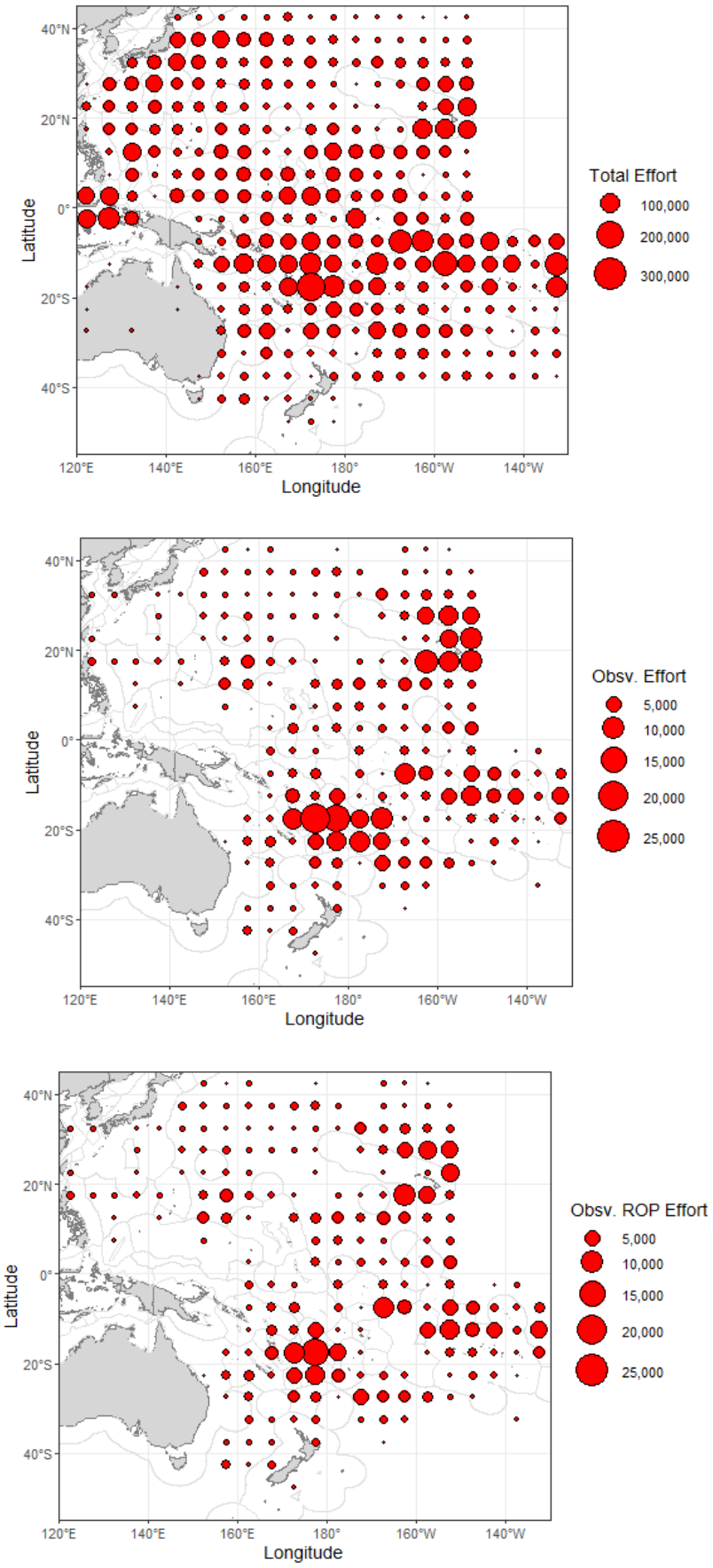


Figure 4. Distribution of longline effort (100 hooks; top), observer (100 hooks; middle) and observed effort (100 hooks; bottom) in the WCPFC Area for 2020.

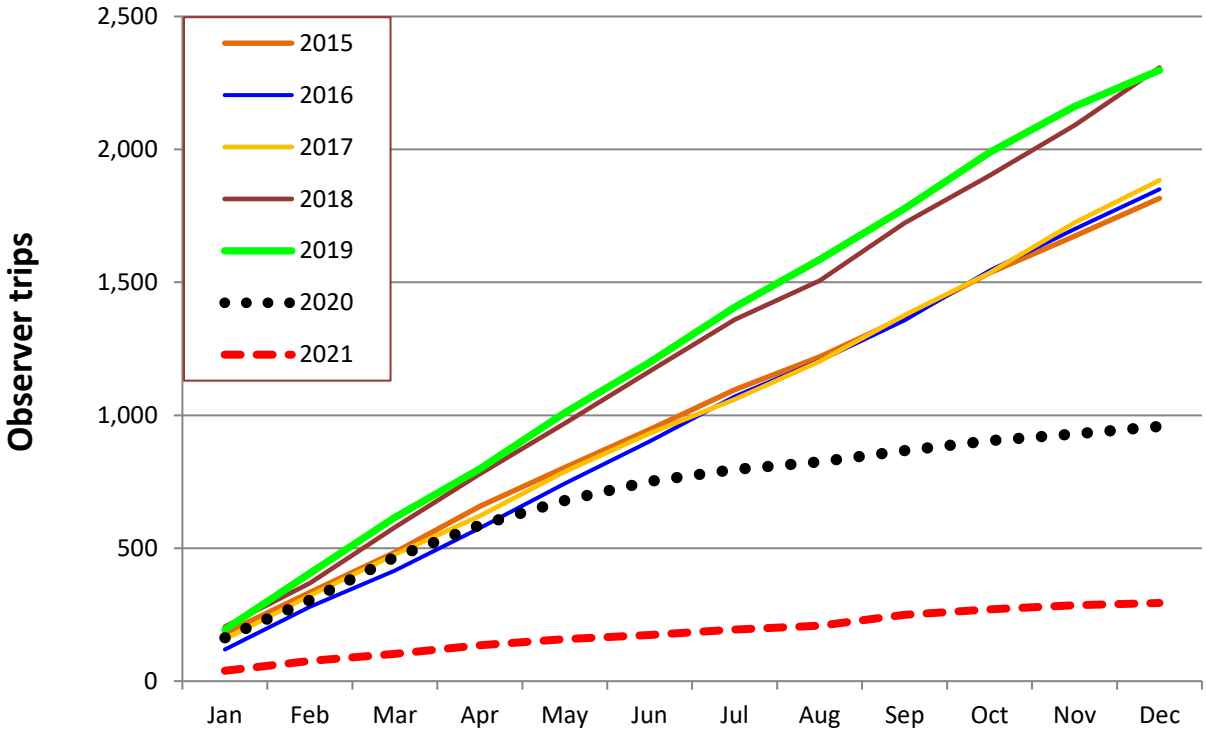


Figure 5. Cumulative monthly purse seine observer trips conducted in the WCPFC Area for 2015–2021 (based on data received and advice on observer placements).

TABLES

Table 1. Summary of the provision and processing of Purse seine Observer data. (Different colours represent categories – see NOTES below)

As at July 2022																		
YEAR	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements		4. TRIP data submitted		5. TRIP data processed				6. Problems awaiting resolution			7. TRIPS not yet sent by Obsv. Progs.		8. TRIP data provided to WCPFC	
			Trips	%	Trips	%	Trips	% of Estimated trips	% of total available trips	% of trips received without problems	Trips	% of total available trips	% of received	Trips	% of total	Trips	% of data processed
2017	2,233	349	1,884	84%	1,814	96%	1,773	79%	94%	99%	20	1%	1%	70	4%	1383	78%
2018	2,337	29	2,308	99%	2,133	92%	2,105	90%	91%	99%	17	1%	1%	175	8%	1731	82%
2019	2,428	130	2,298	95%	2,135	93%	2,123	87%	92%	100%	9	0%	0%	163	7%	1766	83%
2020	2,015	1,057	958	48%	857	89%	849	42%	89%	100%	7	1%	1%	101	11%	606	71%
2021	1,980	1,686	294	15%	294	100%	294	15%	100%	100%	0	0%	0%	0	0%	105	36%

NOTES

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries and purse seine trips undertaken completely outside the tropical waters (20°N-20°S). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips and so the values in this column will be an over-estimate of actual fishing trips.
2. **CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATGEORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips. This category may also include fishing trips without an observer on-board.
3. **CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
4. SPC employs a strategy of processing the most recent observer data as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the **"% of trips received without problems**" in **CATEGORY 5** whereby the outstanding data entry for 2018/2019 has higher priority than outstanding trips data entry in 2016/2017, for example. Every effort has been made to resolve the backlog from previous years.
5. **CATGEORY 7** is essentially the difference between **CATEGORY 3** and **CATEGORY 4**.
6. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 are included in this table.

Table 2. Summary of purse seine observer data received at SPC, by year and flag.

2017										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
China	18	15	3	3	100%	3	100%	100%	3	100%
Ecuador	39	27	12	12	100%	12	100%	100%	12	100%
European Union	25	14	11	11	100%	11	100%	100%	11	100%
FSM	146	2	144	136	94%	131	91%	96%	118	90%
Japan	218	72	146	146	100%	144	99%	99%	144	100%
Kiribati	215	41	174	149	86%	144	83%	97%	139	97%
Korea	262	70	192	187	97%	176	92%	94%	171	97%
Marshall Is.	85	2	83	80	96%	80	96%	100%	78	98%
New Zealand	8	3	5	5	100%	5	100%	100%	5	100%
PNG	515	-1	516	496	96%	489	95%	99%	228	47%
Philippines	93	0	93	93	100%	93	100%	100%	62	67%
Solomon Islands	105	0	105	101	96%	97	92%	96%	29	30%
El Salvador	14	9	5	5	100%	5	100%	100%	5	100%
Tuvalu	7	1	6	5	83%	5	83%	100%	5	100%
Chinese Taipei	244	69	175	171	98%	166	95%	97%	161	97%
USA	229	23	206	206	100%	204	99%	99%	204	100%
Vanuatu	10	2	8	8	100%	8	100%	100%	8	100%
	2233	349	1,884	1,814	96%	1,773	94%	98%	1383	78%

2018										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
China	21	3	18	16	89%	16	89%	100%	16	100%
Ecuador	22	6	16	16	100%	16	100%	100%	16	100%
European Union	14	4	10	10	100%	10	100%	100%	10	100%
FSM	179	0	179	163	91%	158	88%	97%	143	91%
Japan	237	0	237	208	88%	207	87%	100%	206	100%
Kiribati	232	0	232	212	91%	209	90%	99%	189	90%
Korea	283	0	283	234	83%	226	80%	97%	218	96%
Marshall Is.	98	2	96	93	97%	90	94%	97%	90	100%
Nauru	9	1	8	7	88%	7	88%	100%	7	100%
New Zealand	7	4	3	3	100%	3	100%	100%	3	100%
PNG	503	0	503	498	99%	498	99%	100%	240	48%
Philippines	75	0	75	75	100%	75	100%	100%	68	91%
Solomon Islands	115	0	115	91	79%	88	77%	97%	29	33%
El Salvador	11	9	2	2	100%	2	100%	100%	2	100%
Tuvalu	14	0	14	14	100%	13	93%	93%	13	100%
Chinese Taipei	284	0	284	258	91%	254	89%	98%	249	98%
USA	218	0	218	218	100%	218	100%	100%	218	100%
Vanuatu	15	0	15	15	100%	15	100%	100%	14	93%
	2337	29	2,308	2,133	92%	2,105	91%	99%	1731	82%

Table 2. Summary of purse seine observer data received at SPC, by year and flag (continued).

2019										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	3		3	3	100%	3	100%	100%	3	100%
China	2	2	0	0	0%	0	0%	0%	0	0%
Ecuador	30	11	19	19	100%	18	95%	95%	18	100%
European Union	9	0	9	9	100%	9	100%	100%	9	100%
FSM	208	7	201	181	90%	177	88%	98%	173	98%
Japan	218	13	205	160	78%	160	78%	100%	160	100%
Kiribati	279	0	279	265	95%	263	94%	99%	205	78%
Korea	313	0	313	286	91%	286	91%	100%	255	89%
Marshall Is.	114	0	114	107	94%	107	94%	100%	104	97%
Nauru	41	0	41	39	95%	39	95%	100%	38	97%
New Zealand	7	7	0	0	0%	0	0%	0%	0	0%
PNG	469	83	386	378	98%	376	97%	99%	199	53%
Philippines	58	0	58	58	100%	58	100%	100%	58	100%
Solomon Islands	127	0	127	111	87%	111	87%	100%	39	35%
El Salvador	11	6	5	5	100%	5	100%	100%	5	100%
Tuvalu	10	0	10	9	90%	8	80%	89%	8	100%
Chinese Taipei	294	1	293	271	92%	269	92%	99%	259	96%
USA	192	0	192	192	100%	192	100%	100%	192	100%
Vanuatu	43	0	43	42	98%	42	98%	100%	41	98%
	2428	130	2,298	2,135	93%	2,123	92%	99%	1766	83%

2020										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	2	1	1	1	100%	1	100%	100%	1	100%
China	0	0	0	0	0%	0	0%	0%	0	0%
Ecuador	32	23	9	9	100%	9	100%	100%	9	100%
European Union	10	8	2	2	100%	2	100%	100%	2	100%
FSM	227	137	90	76	84%	75	83%	99%	71	95%
Japan	194	151	43	41	95%	41	95%	100%	41	100%
Kiribati	213	128	85	84	99%	82	96%	98%	77	94%
Korea	173	66	107	96	90%	96	90%	100%	93	97%
Marshall Is.	101	71	30	23	77%	22	73%	96%	22	100%
Nauru	106	62	44	39	89%	38	86%	97%	38	100%
New Zealand	8	8	0	0	0%	0	0%	0%	0	0%
PNG	377	159	218	211	97%	211	97%	100%	43	20%
Philippines	55	0	55	55	100%	55	100%	100%	49	89%
Solomon Islands	77	9	68	62	91%	61	90%	98%	7	11%
El Salvador	9	3	6	0	0%	0	0%	0%	0	0%
Tuvalu	10	4	6	6	100%	5	83%	83%	5	100%
Chinese Taipei	239	130	109	68	62%	67	61%	99%	64	96%
USA	135	76	59	59	100%	59	100%	100%	59	100%
Vanuatu	47	21	26	25	96%	25	96%	100%	25	100%
	2015	1,057	958	857	89%	849	89%	99%	606	71%

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued; the first quarter 2020).

2020 Q1										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	9	0	1	1	100%	1	100%	100%	1	100%
China	0	0	0	0	0%	0	0%	0%	0	0%
Ecuador	5	0	5	5	100%	5	100%	100%	5	100%
European Union	44	42	2	2	100%	2	100%	100%	2	100%
FSM	48	0	48	40	83%	39	81%	98%	37	95%
Japan	54	25	29	28	97%	28	97%	100%	28	100%
Kiribati	59	7	52	52	100%	50	96%	96%	47	94%
Korea	58	0	58	54	93%	54	93%	100%	51	94%
Marshall Is.	26	0	26	20	77%	19	73%	95%	19	100%
Nauru	25	0	25	25	100%	25	100%	100%	25	100%
New Zealand	93	93	0	0	0%	0	0%	0%	0	0%
PNG	61	0	61	60	98%	60	98%	100%	15	25%
Philippines	23	0	23	23	100%	23	100%	100%	20	87%
Solomon Islands	22	0	22	21	95%	20	91%	95%	5	25%
El Salvador	2	0	2	0	0%	0	0%	0%	0	0%
Tuvalu	59	57	2	2	100%	1	50%	50%	1	100%
Chinese Taipei	62	0	62	41	66%	41	66%	100%	40	98%
USA	38	0	38	38	100%	38	100%	100%	38	100%
Vanuatu	10	0	10	10	100%	10	100%	100%	10	100%
	698	224	466	422	91%	416	89%	99%	344	83%

2021										
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed			6. TRIP data provided to WCPFC	
				Trips	%	Trips	% of total available trips	% of total trips recvd	Trips	% of data processed
Cook Islands	3	3			0%		0%	0%		0%
China	1	1			0%		0%	0%		0%
Ecuador	24	24			0%		0%	0%		0%
European Union	15	13	2	2	100%	2	100%	100%	2	100%
FSM	212	212			0%		0%	0%		0%
Japan	190	190			0%		0%	0%		0%
Kiribati	219	219			0%		0%	0%		0%
Korea	176	176			0%		0%	0%		0%
Marshall Is.	108	108			0%		0%	0%		0%
Nauru	143	143			0%		0%	0%		0%
New Zealand	7	7			0%		0%	0%		0%
PNG	360	180	180	180	100%	180	100%	100%	53	29%
Philippines	50	0	50	50	100%	50	100%	100%	50	100%
Solomon Islands	72	10	62	62	100%	62	100%	100%	0	0%
El Salvador	11	11			0%		0%	0%		0%
Tuvalu	27	27			0%		0%	0%		0%
Chinese Taipei	270	270			0%		0%	0%		0%
USA	39	39			0%		0%	0%		0%
Vanuatu	53	53			0%		0%	0%		0%
	1980	1,686	294	294	100%	294	100%	100%	105	36%

NOTES

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries and purse seine trips undertaken completely outside the tropical waters (20°N-20°S). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips.
2. **CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATGEORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g., returning to home port in

Asia for annual maintenance) may have been included in the "Estimated" trips. This category may also include fishing trips without an observer on-board.

3. **CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
4. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 are included in this table.

Table 3. Provisional 2020 Longline Regional Observer Programme (ROP) coverage by CCM – based on reporting from CCMs and data submissions
The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE (minimum required for ROP is 5%)						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days fished	52,254	2,968	5.7%	53,000	1,834	3.5%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	2,447	0	0.0%	2,447	0	0.0%	8, 9, 28
EUROPEAN UNION	Distant-water	No. of Trips	13	0	0.0%	13	0	0.0%	4, 10, 19, 28
FSM	Pacific Islands	No. of Trips	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	546	126	23.1%	99	9	9.1%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	21,814	51	0.2%	21,814	51	0.2%	10, 18, 28
	Frozen, long-trip	Days fished	5,407	121	2.2%	5,407	121	2.2%	10, 18, 28
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	32,590	1,249	3.8%	27,392	1,288	4.7%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2,
CHINESE TAIPEI	Small longline – STLL	Days at Sea	84,179	7,333	8.7%	84,179	6,538	7.8%	10, 14
	Distant-water – DWLL	Days at Sea	18,418	2,092	11.4%	18,418	1,291	7.0%	10
USA	HAWAII/California-based	No. of Trips	1,182	193	16.3%	739	187	25.3%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	166	0	0.0%	166	0	0.0%	7, 28

NOTES

1. The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is "days-at-sea". Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
4. In a communication of 28 February 2015, EU advised that they will use "NUMBER OF TRIPS" for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that "*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted*."
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. "Distant-water" vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be "days-at-sea" for these situations.
11. Covers both 'fleets' as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric was "Number of Trips".
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
15. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2020.
16. No longline vessels from Philippines active in 2020.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2020 observer activities including trip monitoring information. Some data submitted recently have yet to be loaded and may not be included in the total effort for submitted data.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2020 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates of data submitted in this table.
23. Effort metric for Korean longline fleet in 2020 is DAYS AT SEA. Coverage of data submitted represents only activity in the WCPFC Area.
24. No activity in 2020 by this CCM's longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2020.
26. Excludes trips/activities from chartered vessels and also non-fishing trips.
27. The information provided for these fleets EXCLUDES activities of either domestically-based (in home EEZ) or locally-based components of this fleet; that is, vessels from this fleet that fish exclusively in one Pacific Island EEZ and adjacent high seas only are not included (i.e. considered non-ROP trips); the coverage represents the component that conduct ROP-defined trips only.
28. A number of countries advised that there was no ROP longline coverage in 2020 due to the COVID-19 situation.

Table 4. Provisional 2021 Longline Regional Observer Programme (ROP) coverage by CCM – based on reporting from CCMs and data submissions
The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE (minimum required for ROP is 5%)						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days fished	37,820	3,724	9.8%	37,820	2,073	5.5%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	1,516	90	5.9%	1,516	90	5.9%	8
EUROPEAN UNION	Distant-water	No. of Trips	22	0	0.0%	22	0	0.0%	4, 10, 19, 28
FSM	Pacific Islands	No. of Trips	–	–	–	–	–	–	26, 27
FIJI	Pacific Islands	No. of Trips	443	72	16.3%	64	13	20.3%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	20,006	20	0.1%	20,006	33	0.2%	10, 18
	Frozen, long-trip	Days fished	5,578	0	0.0%	5,578	0	0.0%	10, 18, 28
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	31,252	618	2.0%	31,252	618	2.0%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2,
CHINESE TAIPEI	Small longline – STLL	Days at Sea	59,742	5,928	9.9%	59,742	1,418	2.4%	10, 14
	Distant-water – DWLL	Days at Sea	17,508	2,685	15.3%	17,508	445	2.5%	10
USA	HAWAII/California-based	No. of Trips	1,206	275	22.8%	1,206	279	23.1%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Islands and DW	No. of Trips	383	0	0.0%	383	0	0.0%	7, 28

NOTES

1. The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is "days-at-sea". Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
4. In a communication of 28 February 2015, EU advised that they will use "NUMBER OF TRIPS" for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that "*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted*."
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. "Distant-water" vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be "days-at-sea" for these situations.
11. Covers both 'fleets' as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric was "Number of Trips".
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
15. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2021.
16. No longline vessels from Philippines active in 2021.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2021 observer activities including trip monitoring information. Some data submitted recently have yet to be loaded and may not be included in the total effort for submitted data.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2021 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates of data submitted in this table.
23. Effort metric for Korean longline fleet in 2021 is DAYS AT SEA. Coverage of data submitted represents only activity in the WCPFC Area.
24. No activity in 2021 by this CCM's longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2021.
26. Excludes trips/activities from chartered vessels and also non-fishing trips.
27. The information provided for these fleets EXCLUDES activities of either domestically-based (in home EEZ) or locally-based components of this fleet; that is, vessels from this fleet that fish exclusively in one Pacific Island EEZ and adjacent high seas only are not included (i.e. considered non-ROP trips); the coverage represents the component that conduct ROP-defined trips only.
28. A number of countries advised that there was no ROP longline coverage in 2021 due to the COVID-19 situation.

Table 5. Coverage of Longline Observer data in the WCFPC Area, for 2020 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data.

	Hooks		
CCM Fleet	Total Effort	Observer	
AUSTRALIA	8,130,185	0	
CHINA	156,763,980	7,450,588	
COOK ISLANDS	9,255,695	0	
EUROPEAN UNION	952,989	*0*	
FIJI	46,941,519	5,160,006	
FRENCH POLYNESIA	18,341,479	1,002,040	
FSM	28,390,701	791,116	
INDONESIA	8,918,471	0	
JAPAN	31,257,262	459,213	
KIRIBATI	18,755,428	442,279	
MARSHALL ISLANDS	7,956,465	101,600	
NEW CALEDONIA	6,353,475	431,435	
NEW ZEALAND	1,949,002	193,329	
PALAU	5,700	0	
PAPUA NEW GUINEA	594,186	0	
REPUBLIC OF KOREA	56,368,161	1,279,170	
SAMOA	11,303,482	35,296	
SOLOMON ISLANDS	20,483,504	0	
TONGA	781,827	87,639	
TUVALU	538,600	0	
CHINESE TAIPEI	170,768,578	8,460,291	
USA	64,640,744	5,341,862	
VANUATU	19,252,147	0	
Total	**688,703,580**	**31,235,864**	**4.5%**

NOTES

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.
3. Observer data have been provided for activities outside of WCPFC area but are not included here.

Table 6. Coverage of Longline Observer data in the WCFPC Area, for 2021 (all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data).

	Hooks		
CCM Fleet	Total Effort	Observer	
AUSTRALIA	7,325,587	0	
CHINA	148,066,158	3,165,167	
COOK ISLANDS	6,075,436	125,207	
EUROPEAN UNION	1,261,700		
FIJI	36,872,130	3,433,207	
FRENCH POLYNESIA	20,034,657	1,053,283	
FSM	22,866,291	116,285	
INDONESIA	34,475,431		
JAPAN	22,425,888	38,064	
KIRIBATI	10,436,180	364,555	
MARSHALL ISLANDS	7,222,419	263,069	
NEW CALEDONIA	6,201,151	428,504	
NEW ZEALAND	1,546,737	0	
PALAU	0	0	
PAPUA NEW GUINEA	0	0	
REPUBLIC OF KOREA	55,406,035	824,940	
SAMOA	3,969,268	0	
SOLOMON ISLANDS	18,240,495	0	
TONGA	676,111	122,068	
TUVALU	308,359	0	
CHINESE TAIPEI	139,201,996	2,543,003	
USA	73,641,695	6,958,720	
VANUATU	28,252,901	0	
Total	**644,506,625**	**19,436,072**	**3.0%**

Notes

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.
3. Observer data have been provided for activities outside of WCPFC area but are not included here.

Table 7. Contribution of Pacific Islands' observer programmes to observer coverage, by gear, for 2020 (top) and 2021 (bottom).

2020				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	3	0.2%	1	0.02%
FEDERATED STATES OF MICRONESIA	11	0.4%	0	0.00%
FIJI	0	0.0%	134	0.59%
FRENCH POLYNESIA	0	0.0%	48	0.09%
KIRIBATI	158	7.3%	0	0.00%
MARSHALL ISLANDS	1	0.0%	12	0.02%
NAURU	0	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	27	0.07%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	237	8.3%	0	0.00%
PHILIPPINES	46	2.0%	0	0.00%
PNA Observer Programme	275	11.1%	0	0.00%
SAMOA	0	0.0%	2	0.00%
SOLOMON ISLANDS	115	4.3%	0	0.00%
TONGA, KINGDOM OF	0	0.0%	32	0.33%
TUVALU	53	3.2%	0	0.00%
US MLT Observer Programme	59	3.3%	0	0.00%
VANUATU	0	0.0%	56	0.38%
Total	958	38.1%	312	1.50%

2021				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% [1]	Trips	Cov% [2]
COOK ISLANDS	2	0.2%	2	0.02%
FEDERATED STATES OF MICRONESIA	0	0.0%	0	0.00%
FIJI	0	0.0%	54	0.32%
FRENCH POLYNESIA	0	0.0%	57	0.15%
KIRIBATI	0	0.0%	0	0.00%
MARSHALL ISLANDS	0	0.0%	19	0.07%
NAURU	0	0.0%	0	0.00%
NEW CALEDONIA	0	0.0%	24	0.10%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	180	6.0%	0	0.00%
PHILIPPINES	50	1.4%	0	0.00%
PNA Observer Programme	0	0.0%	0	0.00%
SAMOA	0	0.0%	0	0.00%
SOLOMON ISLANDS	62	1.4%	0	0.00%
TONGA, KINGDOM OF	0	0.0%	46	0.35%
TUVALU	0	0.0%	0	0.00%
US MLT Observer Programme	0	0.0%	0	0.00%
VANUATU	0	0.0%	10	0.08%
Total	294	7.6%	212	1.09%

NOTES

1. Cov% represents coverage in the tropical WCPFC purse seine fishery using total target tuna catch estimate as the metric.
2. Cov% represents coverage in the WCPFC longline fishery using total target tuna catch estimate as the metric.
3. Trips represent observer trips conducted by the observer programme. This metric is not used in the estimate of coverage (see notes 1. and 2. above).
4. Represents data received at SPC, including some data not yet to be processed.

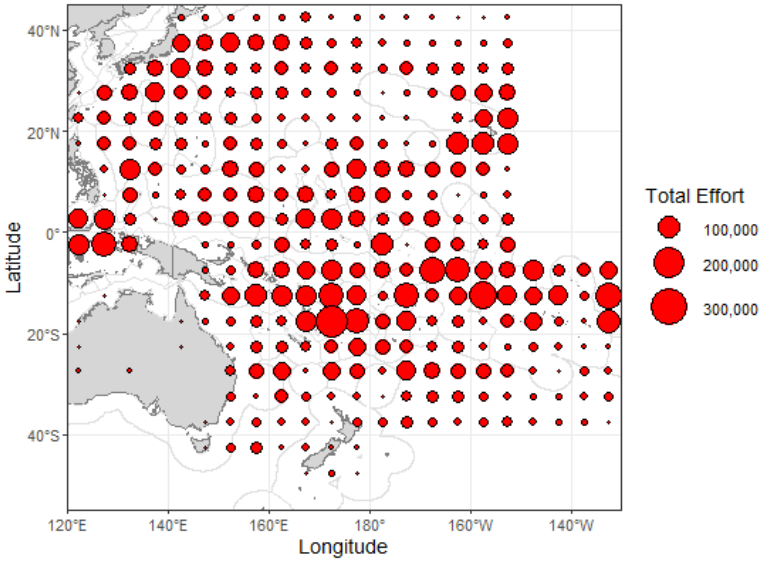
Table 8. Annual longline E-Monitoring (EM) data reviews (sets), by national EM programme, 2015–2021.

	E-MONITORING DATA (Sets reviewed)						
EM Programme	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
AUSTRALIA	*56*	*420*	*528*	*489*	*525*	*418*	*...*
FIJI	222	621	2,170	1510	405	-	-
FSM	-	311	283	21	104	54	10
MARSHALL ISLANDS	-	-	944	523	310	-	-
PALAU	-	102	153	56	-	-	-
SOLOMON ISLANDS	-	-	74	25	-	-	-

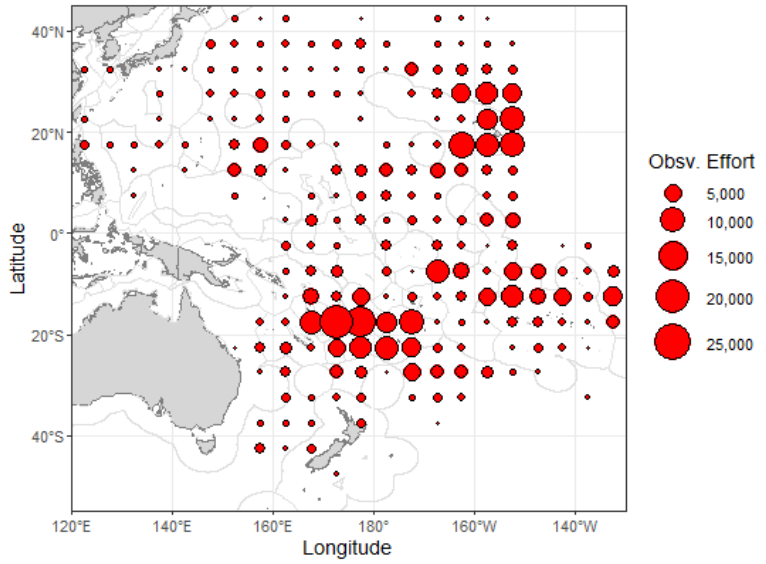
NOTES

1. According to data submitted to SPC.
2. 2021 values are provisional. Provision of Australia EM data for 2021 are pending.

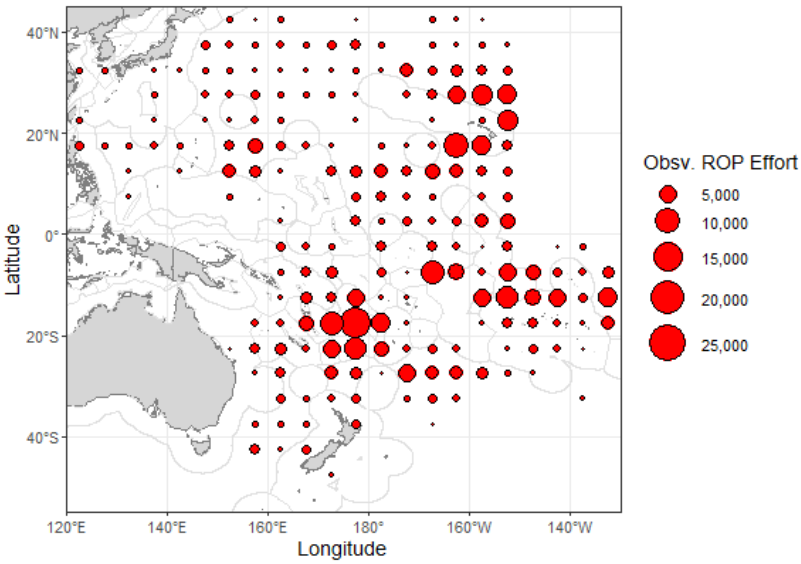
ANNEX 1 – Maps showing Longline and Purse seine Observer coverage



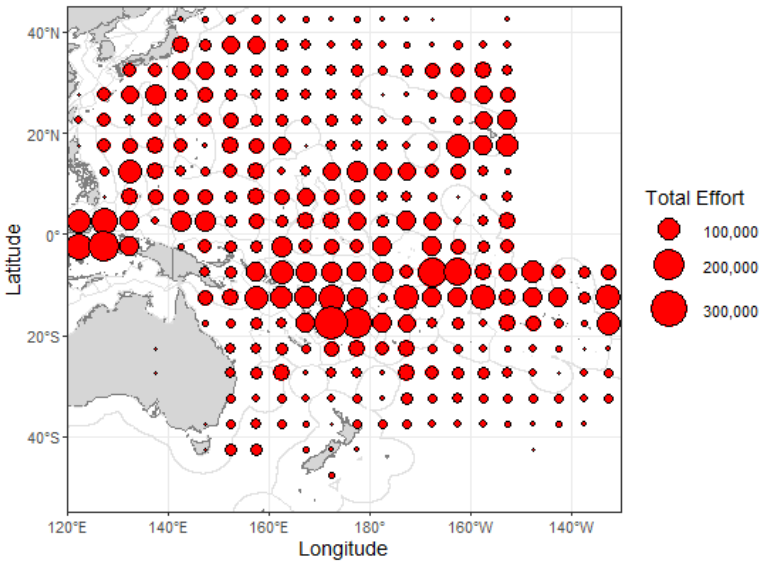
2020 – Longline All effort



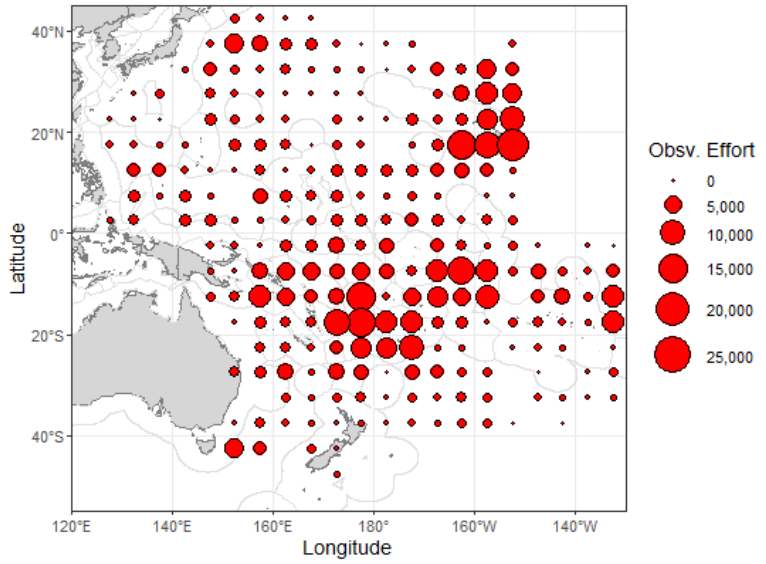
2020 – Longline Observer effort



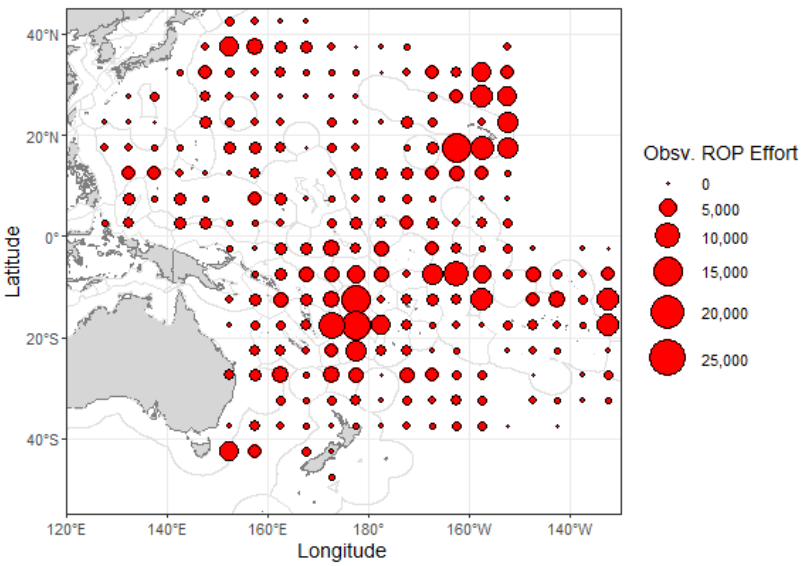
2020 – Longline ROP effort



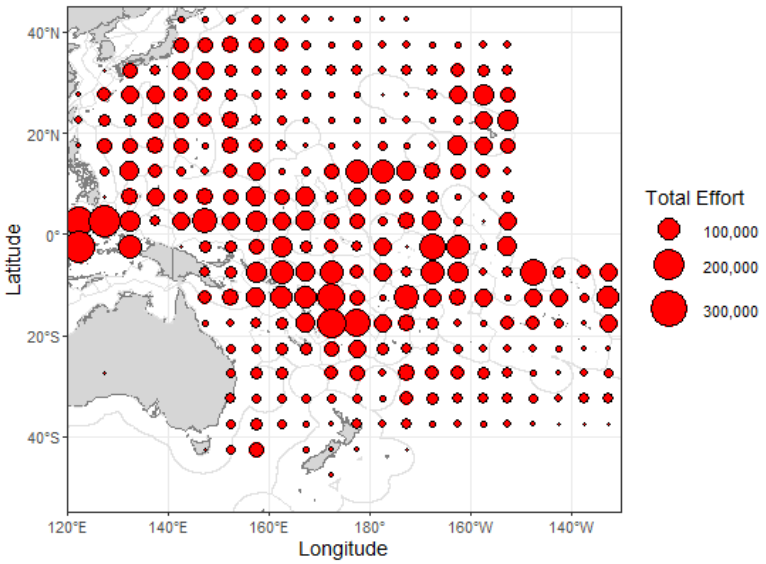
2019 – Longline All effort



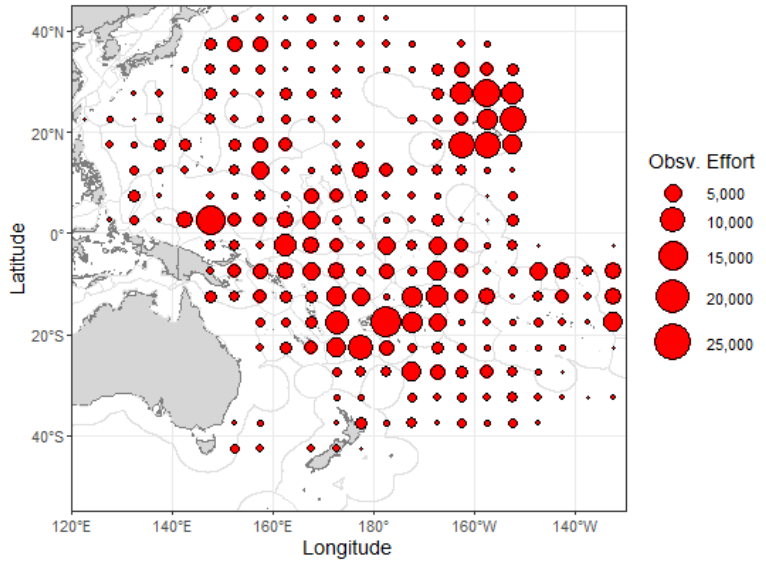
2019 – Longline Observer effort



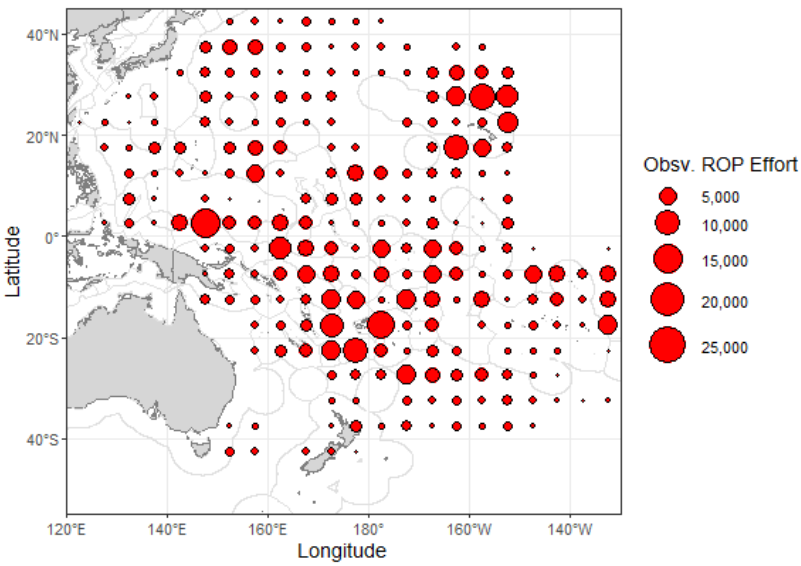
2019 – Longline ROP effort



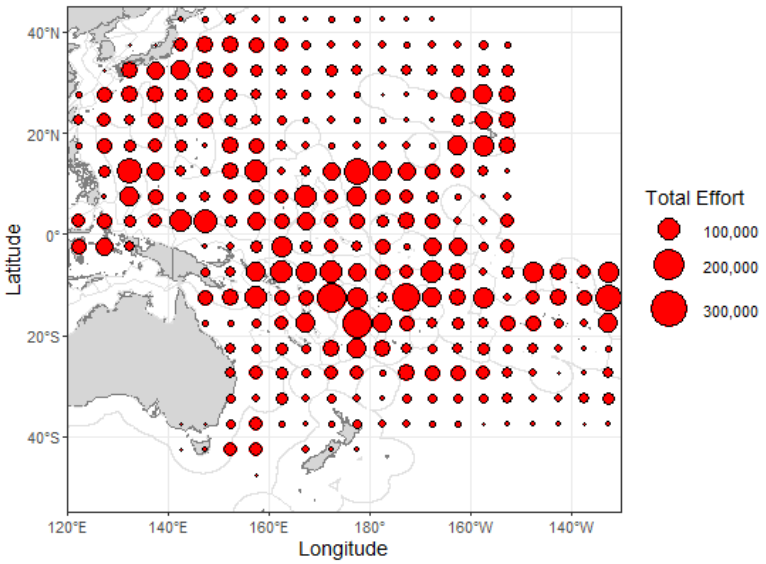
2018 – Longline All effort



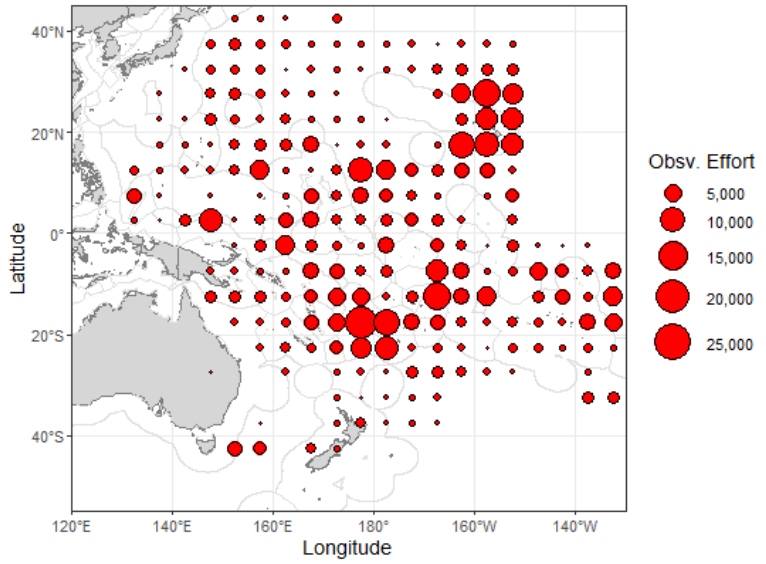
2018 – Longline Observer effort



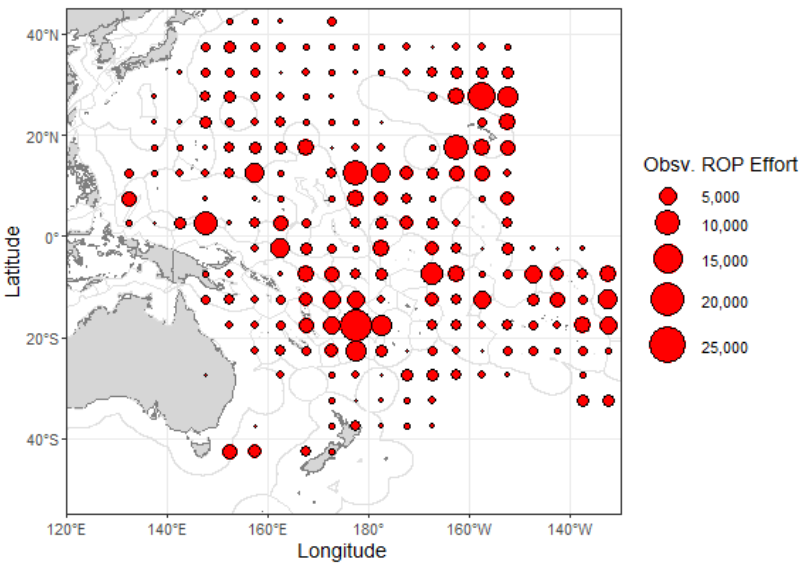
2018 – Longline ROP effort



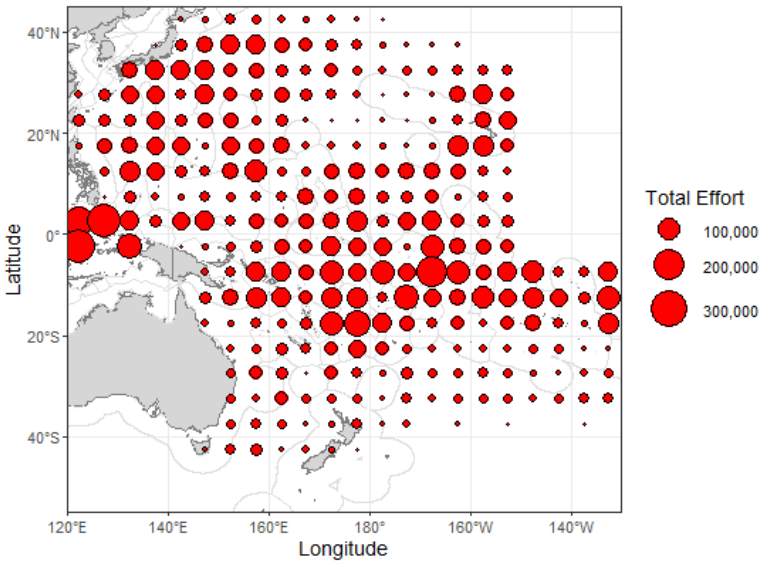
2017 – Longline All effort



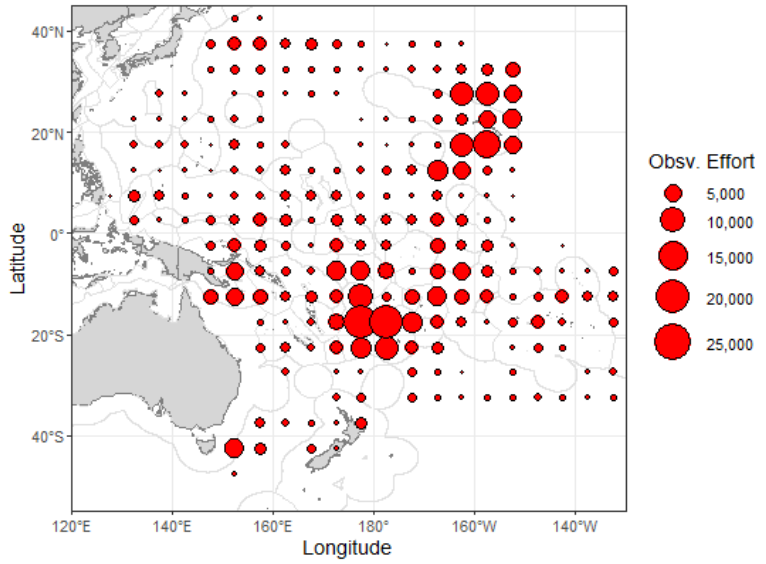
2017 – Longline Observer effort



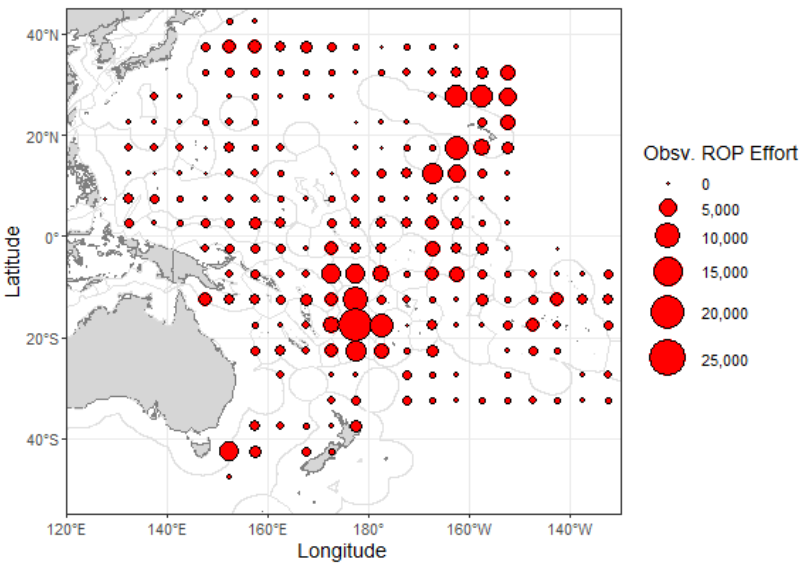
2017 – Longline ROP effort



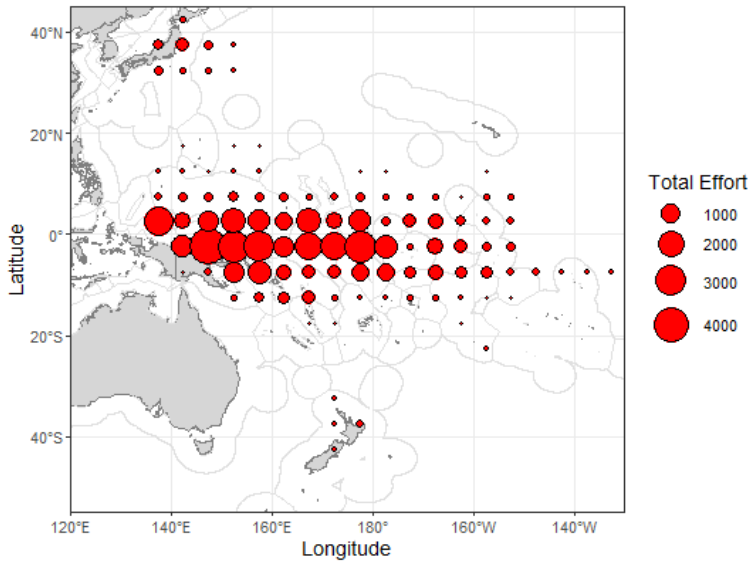
2016 – Longline All effort



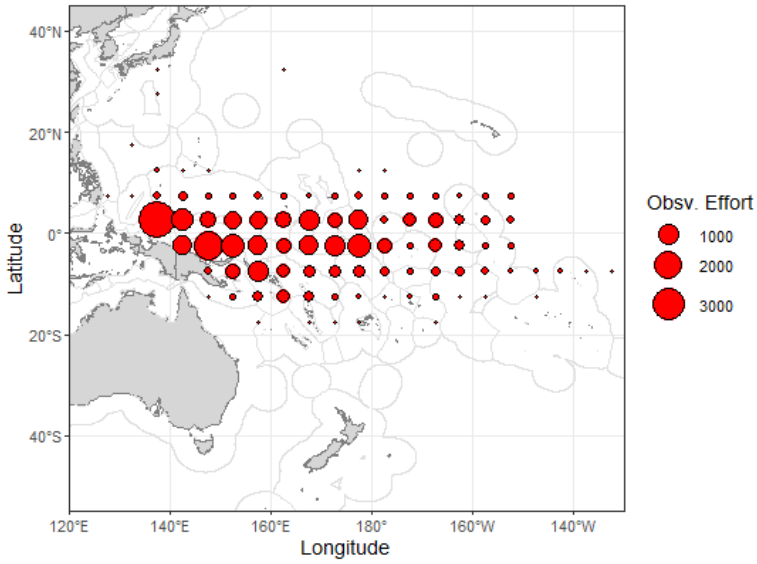
2016 – Longline Observer effort



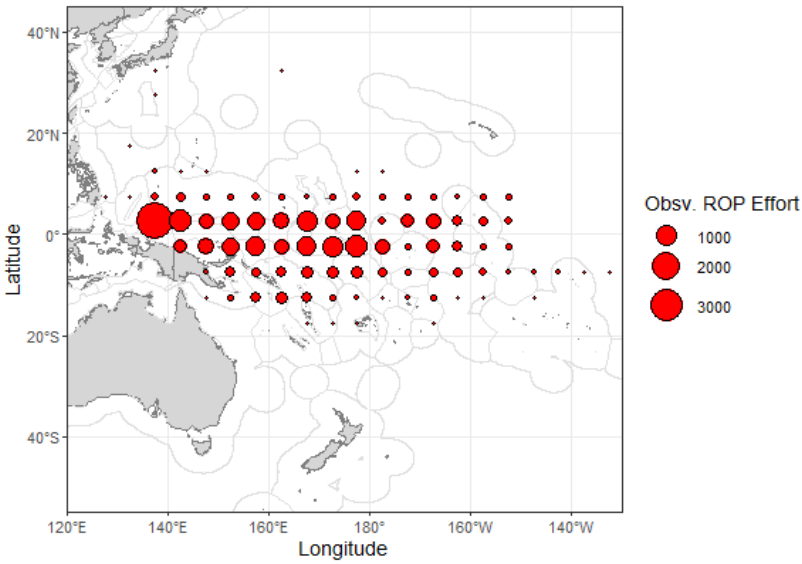
2016 – Longline ROP effort



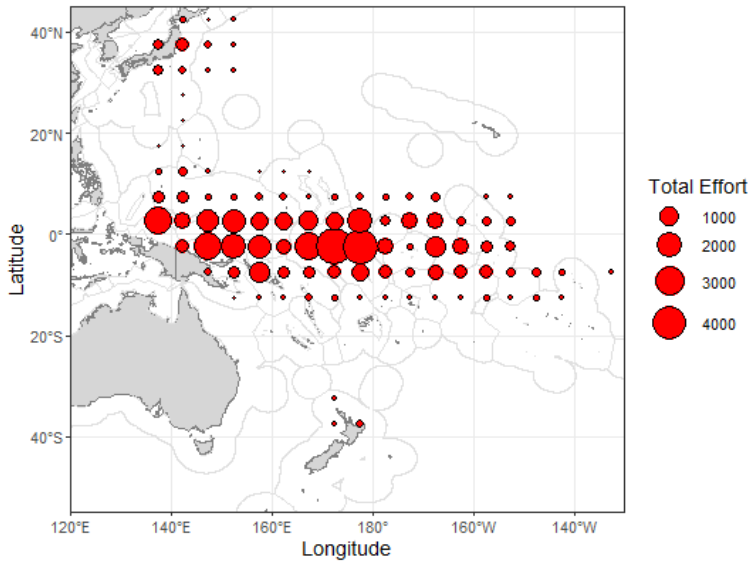
2020 – Purse seine All effort



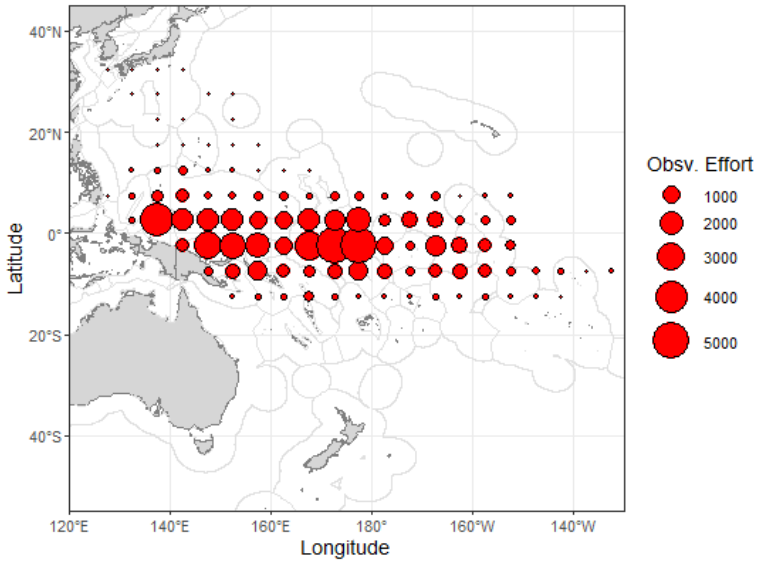
2020 - Purse seine Observer effort



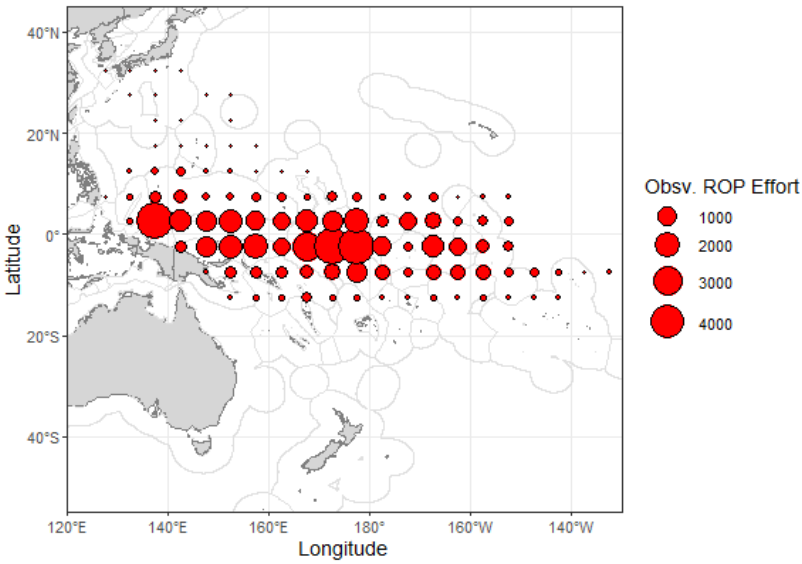
2020 – Purse seine ROP effort



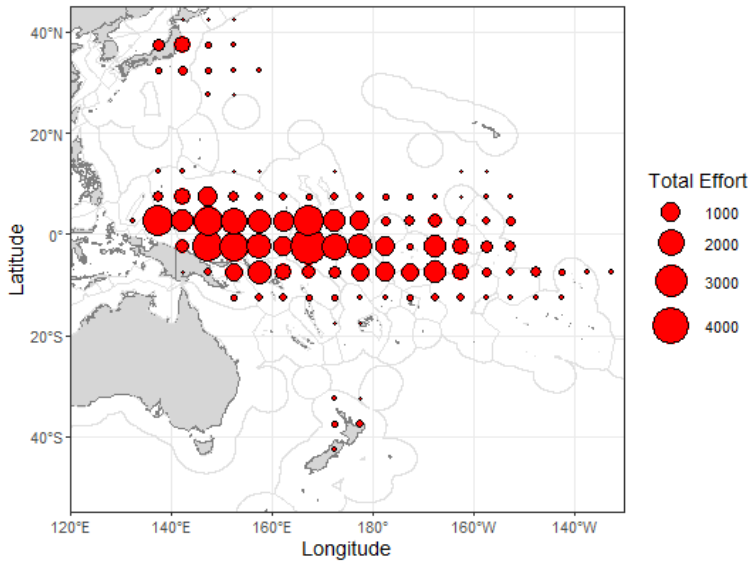
2019 – Purse seine All effort



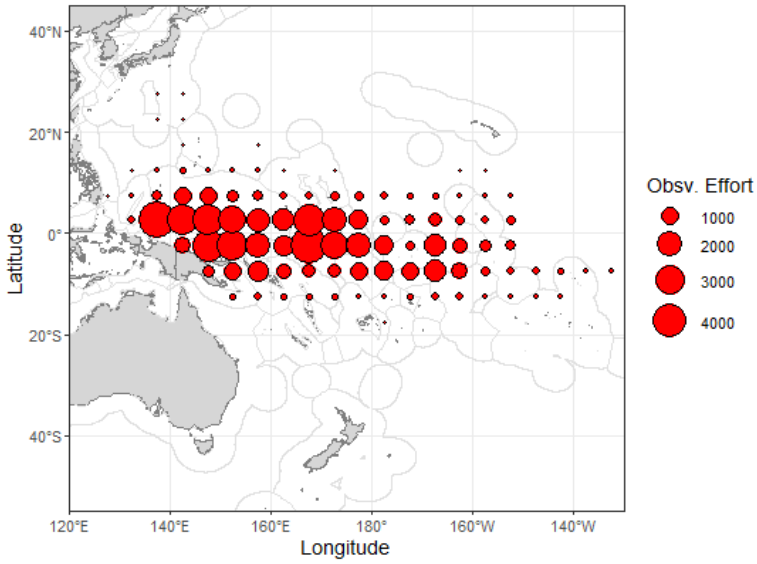
2019 – Purse seine Observer effort



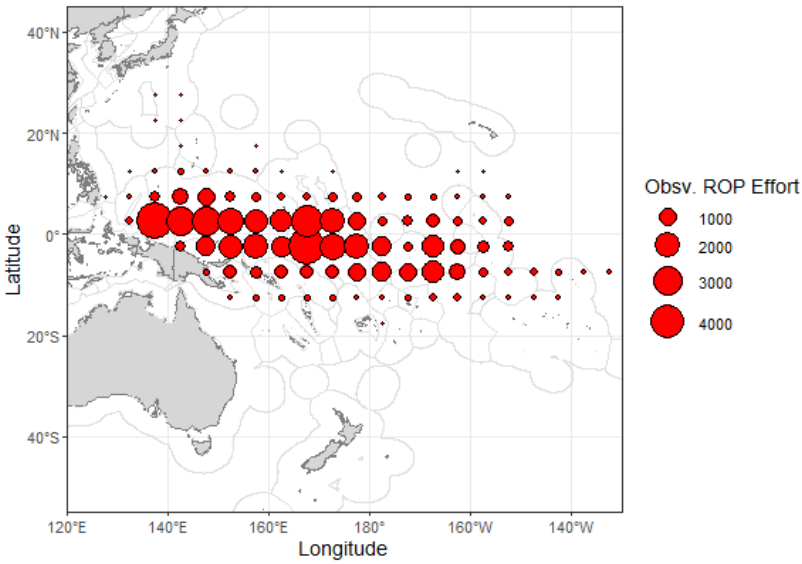
2019 – Purse seine ROP effort



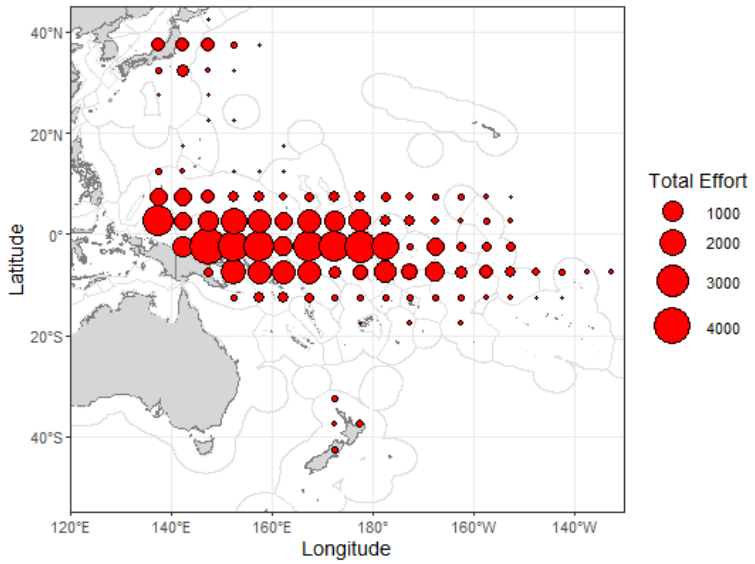
2018 – Purse seine All effort



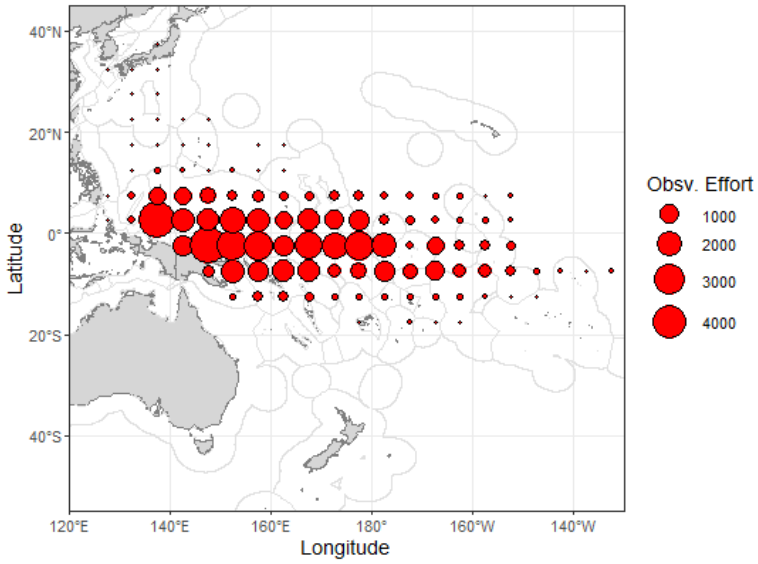
2018 – Purse seine Observer effort



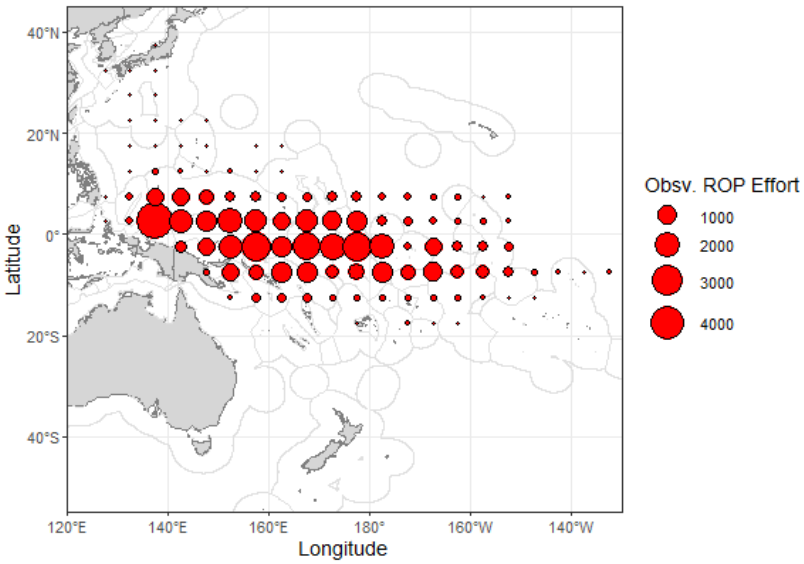
2018 – Purse seine ROP effort



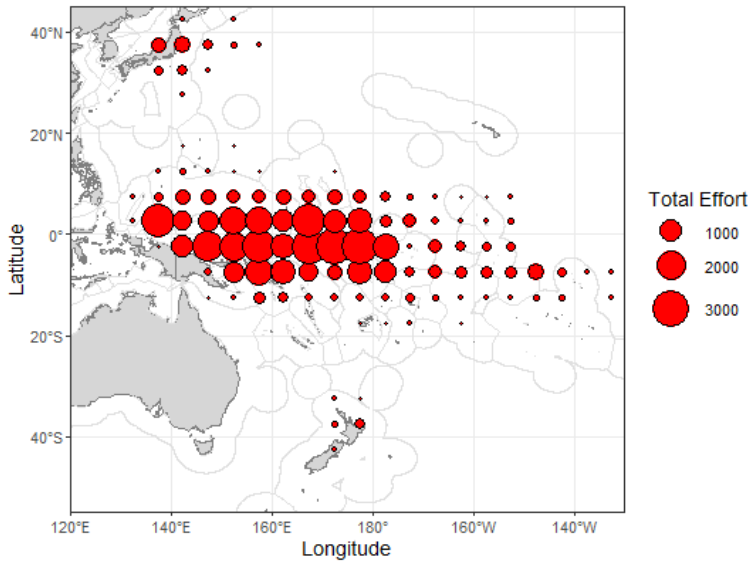
2017 – Purse seine All effort



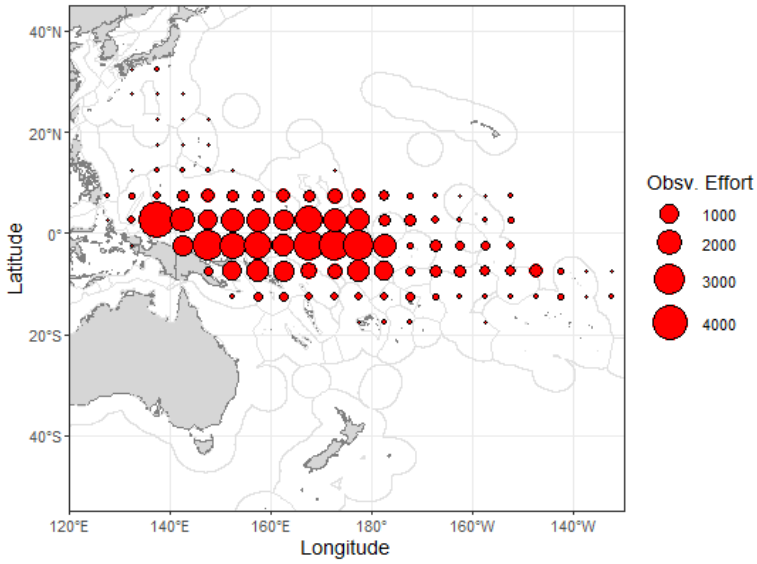
2017 – Purse seine Observer effort



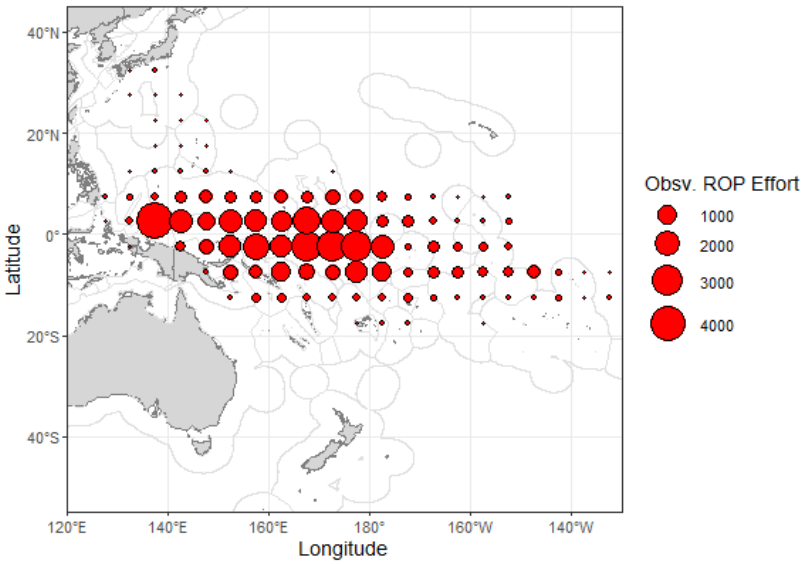
2017 – Purse seine ROP effort



2016 – Purse seine All effort



2016 – Purse seine Observer effort



2016 – Purse seine ROP effort

ANNEX 2 – Tables showing Longline and Purse seine Observer coverage

LL Effort 2021

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	527,166	50,577	50,577
2. Longline tropical 20N - 10S	2,547,215	85,234	81,422
3. Longline 10S to 25S	2,630,941	71,843	47,930
4. Longline 25S to 30S	193,285	3,914	3,914
5. Longline south of 30S	546,459	121	121
Total	**6,445,066**	**211,689**	**183,964**

LL Effort 2020

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,183,457	56,740	56,740
2. Longline tropical 20N - 10S	2,905,124	106,567	103,210
3. Longline 10S to 25S	2,975,632	142,757	98,536
4. Longline 25S to 30S	265,910	16,707	16,707
5. Longline south of 30S	736,968	7,605	7,605
Total	**8,067,091**	**330,376**	**282,798**

LL Effort 2019

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,181,262	80,180	80,180
2. Longline tropical 20N - 10S	3,902,609	184,756	161,146
3. Longline 10S to 25S	3,407,649	166,895	122,823
4. Longline 25S to 30S	252,993	21,327	21,327
5. Longline south of 30S	554,044	20,478	20,478
Total	**9,298,557**	**473,636**	**405,954**

LL Effort 2018

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,059,010	89,673	89,673
2. Longline tropical 20N - 10S	4,525,653	191,130	173,541
3. Longline 10S to 25S	2,697,228	150,735	136,581
4. Longline 25S to 30S	238,451	18,149	18,149
5. Longline south of 30S	629,086	12,216	12,216
Total	**9,149,428**	**461,903**	**430,160**

LL Effort 2017

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,092,654	72,526	72,526
2. Longline tropical 20N - 10S	3,196,110	178,513	168,190
3. Longline 10S to 25S	2,910,669	141,138	115,353
4. Longline 25S to 30S	307,608	6,549	6,479
5. Longline south of 30S	578,161	12,863	12,863
Total	**8,085,202**	**411,589**	**375,411**

LL Effort 2016

Location	Total effort hooks	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
1. LL subtropical north of 20N	1,274,979	58,363	58,363
2. Longline tropical 20N - 10S	4,119,191	124,891	105,573
3. Longline 10S to 25S	2,809,937	133,633	94,543
4. Longline 25S to 30S	220,076	2,363	2,363
5. Longline south of 30S	444,783	15,685	15,685
Total	**8,868,966**	**334,935**	**276,527**

*Total effort - Source : LONGLINE aggregated and raised Catch/Effort database

PS - Effort 2021			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	142	-	-
Purse seine 20N – 20S	43,872	9,640	5,994
Purse seine S of 20S	129	-	-
Total	**44,143**	**9,640**	**5,994**

PS - Effort 2020			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	1,053	3	3
Purse seine 20N – 20S	47,336	23,504	18,840
Purse seine S of 20S	120	-	-
Total	**48,509**	**23,507**	**18,843**

PS - Effort 2019			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	1,242	12	12
Purse seine 20N – 20S	45,123	48,289	42,870
Purse seine S of 20S	128	-	-
Total	**46,493**	**48,301**	**42,882**

PS - Effort 2018			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	1,156	5	5
Purse seine 20N – 20S	47,690	52,315	45,242
Purse seine S of 20S	112	-	-
Total	**48,958**	**52,320**	**45,247**

PS - Effort 2017			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	1,449	14	14
Purse seine 20N – 20S	50,294	48,522	40,519
Purse seine S of 20S	152	-	-
Total	**51,895**	**48,536**	**40,533**

PS - Effort 2016			
Location	Total effort days	Total observed effort (SPC data)	Total ROP observed effort (WCPFC data)
Purse seine N of 20N	1,438	13	13
Purse seine 20N – 20S	46,855	44,184	38,077
Purse seine S of 20S	197	-	-
Total	**48,490**	**44,197**	**38,090**

*Total effort - Source : PURSE SEINE aggregated and raised Catch/Effort database